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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,173	03/26/2004	Yee Loong Chin	70030949-1	7995

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EXAMINER	
LIVEDALEN, BRIAN J	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 08/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/810,173	CHIN ET AL.	
	Examiner	Art Unit	
	Brian J. Livedalen	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to amendment filed 8/7/2006. Claims 1-22 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-22 are under 35 U.S.C. 103(a) as being unpatentable over Wijntjes et al. (2005/0002032), (priority from provisional 60/468286 Filed May 5, 2003) in view of Hutchinson et al. (5235177).

In regard to claim 1, Wijntjes discloses (fig. 4, fig. 10A) a polaroid encoder system for detecting movement, the system having a movable polarizing code element (114); a detector module to detect an amplitude based on how much illumination passes through a first portion of the movable polarizing code element, the detector module having a illumination light detector (120A) covered with a first static polarizing filter (116A) that is oriented in a first direction; a second illumination detector (120B) covered with a second static polarizing filter (116B) that is oriented in a second direction (page 4, paragraphs 0067, 0068); a first determination module to identify a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; wherein the first determination module has an illumination detector (fig. 16A, 802A) and a second determination

module (fig. 16B, 804) coupled to receive the amplitude and the quadrant and to determine an angular position of the movable polarizing code element using the amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes fails to disclose the polarizing code element having a code. However, Hutchinson discloses (fig. 4) a polarizing disc with coded tracks for measuring the quadrant of the disc (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use code to determine the position of the disk in order to increase accuracy in detection. Wijntjes in view of Hutchinson further discloses in Wijntjes (fig. 14) the polarizing code element having a first concentric code extending over two of four quadrants of the movable polarizing code element and a second concentric code extending over two of four quadrants of the movable polarizing segment, the first and second concentric codes juxtaposed one another over one of the four quadrants of the movable polarizing code. Wijntjes discloses using the four quadrants to determine angular position but is not explicit that the angular position is determined using a respective equation associated with each of the quadrants. However, Hutchinson discloses determining the angular position by using a respective equation associated with each of the quadrants (column 3, line 33 – column 4, line 10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the angular position using a respective equation associated with each of the quadrants in order to most simply and accurately determine an angular position based on the unique characteristics of each quadrant.

In regard to claim 9, Wijntjes discloses (fig. 4, fig. 10A) a method for determining angular position of a movable polarizing code element, the method including illuminating the movable polarizing code element; detecting a first amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a first static polarizing filter (116A) oriented in a first direction; detecting a second amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a second static polarizing filter (116B) oriented in a second direction (page 4, paragraphs 0067, 0068); determining a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; and determining the angular position of the movable polarizing code element using the first amplitude, the second amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes discloses using photodetectors (120A, 120B; fig. 16A, 802A) to perform detection of the first and second amplitudes and determining the quadrant, but fails to disclose using photodiodes. However, Wijntjes teaches using a photodiode to perform measurement of the polarizing disc in another embodiment (page 3, paragraph 0046). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use photodiodes to detect the positioning of the disc in order to accurately, yet inexpensively, detect the light impinging on the detectors. Wijntjes fails to disclose the polarizing code element having a code. However, Hutchinson discloses (fig. 4) a polarizing disc with coded tracks for measuring the quadrant of the disc (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was

made to use code to determine the position of the disk in order to increase accuracy in detection. Wijntjes in view of Hutchinson further discloses in Wijntjes (fig. 14) the polarizing code element having a first concentric code extending over two of four quadrants of the movable polarizing code element and a second concentric code extending over two of four quadrants of the movable polarizing segment, the first and second concentric codes juxtaposed one another over one of the four quadrants of the movable polarizing code. Wijntjes discloses using the four quadrants to determine angular position but is not explicit that the angular position is determined using a respective equation associated with each of the quadrants. However, Hutchinson discloses determining the angular position by using a respective equation associated with each of the quadrants (column 3, line 33 – column 4, line 10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the angular position using a respective equation associated with each of the quadrants in order to most simply and accurately determine an angular position based on the unique characteristics of each quadrant.

In regard to claim 17, Wijntjes discloses (fig. 4, fig. 10A) a method for determining angular position of a movable polarizing code element, the method including means for illuminating the movable polarizing code element (110); means for detecting a first amplitude based on how much illumination passes through a first portion of the movable polarizing code element and a first static polarizing filter (116A) oriented in a first direction (120A); means for detecting a second amplitude based on how much illumination passes through a first portion of the movable polarizing code

element and a second static polarizing filter (116B) oriented in a second direction (120B) (page 4, paragraphs 0067, 0068); means for identifying a quadrant of the movable polarizing code element based on how much illumination passes through a second portion of the movable polarizing code element; and means for determining the angular position of the movable polarizing code element using the first amplitude, the second amplitude and the quadrant (page 7, paragraphs 0106-0112). Wijntjes fails to disclose the polarizing code element having a code. However, Hutchinson discloses (fig. 4) a polarizing disc with coded tracks for measuring the quadrant of the disc (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use code to determine the position of the disk in order to increase accuracy in detection. Wijntjes in view of Hutchinson further discloses in Wijntjes (fig. 14) the polarizing code element having a first concentric code extending over two of four quadrants of the movable polarizing code element and a second concentric code extending over two of four quadrants of the movable polarizing segment, the first and second concentric codes juxtaposed one another over one of the four quadrants of the movable polarizing code. Wijntjes discloses using the four quadrants to determine angular position but is not explicit that the angular position is determined using a respective equation associated with each of the quadrants. However, Hutchinson discloses determining the angular position by using a respective equation associated with each of the quadrants (column 3, line 33 – column 4, line 10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the angular position using a respective equation associated with

each of the quadrants in order to most simply and accurately determine an angular position based on the unique characteristics of each quadrant.

In regard to claims 2, 3, 10, 15, 16, and 18, Wijntjes discloses (fig. 16B) a controller module (810) coupled to receive angular position of the movable polarizing element and the controller module uses the angular position to control a movable device coupled with the movable-polarizing code element; wherein the controller module is a motor controller (page 6, paragraph 0095 "motion control and measurement for various types of motors", page 7, paragraph 0111).

In regard to claims 5 and 22, Wijntjes discloses using photodetectors (120A, 120B; fig. 16A, 802A) to perform detection of the first and second amplitudes and determining the quadrant (with static polarizing filters covering detectors 120A and 120B), but fails to disclose using photodiodes. However, Wijntjes teaches using a photodiode to perform measurement of the polarizing disc in another embodiment (page 3, paragraph 0046). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use photodiodes to detect the positioning of the disc in order to accurately, yet inexpensively, detect the light impinging on the detectors.

In regard to claims 6, 11, 12, 19 and 20, Hutchinson further discloses (fig. 4) that the first and second concentric codes are substantially opaque (column 2, lines 56-58), and Wijntjes in view of Hutchinson discloses that the opaque code substantially obscures the illumination received by the illumination detector of the means for identifying the quadrant.

In regard to claim 7, Wijntjes in view of Hutchinson discloses in Wijntjes (fig. 14) that the first and second concentric codes are located in a segment of the second portion of the movable polarizing code element.

In regard to claims 8 and 13, Wijntjes in view of Hutchinson discloses in Wijntjes (fig. 16A) that the first determination module further has a second illumination detector (802B) located on the same side of the movable polarizing code element as the first and second illumination detectors of the detector module (page 7, paragraph 0106-109).

In regard to claim 16, Wijntjes discloses detecting how much illumination passes through the second portion of the movable polarizing code element

In regard to claims 4, 14, and 21, Wijntjes discloses a polaroid encoder which uses two detectors each covered by a polarizing filter. Wijntjes also discloses a third detector with polarizing filter. The three filters are each 120 degrees out of phase, which is the maximum amount that three filters can be out of phase (page 2, paragraph 0018). Therefore, Wijntjes teaches placing filters out of phase with each other at the maximum amount, but fails to disclose the first two filters being 90 degrees out of phase. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the first two filters of a two filter system 90 degrees out of phase so that the two filters are the maximum amount out of phase, allowing the greatest possible precision.

Response to Arguments

Applicant's arguments filed 8/7/2006 have been fully considered but they are not persuasive. Applicant asserts that Wijntjes fails to disclose "a first concentric code extending over two of four quadrants." However, the words "extending over" do not imply that the code extends over all 180 degrees of the quadrants. Taking the broadest reasonable interpretation, the words merely imply that the code is located in at least two quadrants. Furthermore the term "juxtaposed" does not infer that the two codes must be side by side with no gaps in between. Webster's dictionary defines juxtaposed as "placed side by side." This definition does not necessitate the objects being directly adjacent and continuous one with another. Therefore, the two codes of Wijntjes meet this limitation. Finally, Applicant contends that Hutchinson does not disclose that "the angular position is determined using a respective equation associated with each of the quadrants." Hutchinson does disclose using an equation that is a function of intensity and angle. *See* column 3, line 37. Hutchinson then discloses adding a unique value that represents each quadrant. *See* column 3, line 52-64. By combining the first equation with a unique value for each quadrant, Hutchinson effectively uses four separate equations similar to the equations Applicant discloses in the present application. *See* page 27, line 20 – page 28, line 3. Therefore, the claims as amended do not overcome the combination of Wijntjes and Hutchinson.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Livedalen whose telephone number is (571) 272-2715. The examiner can normally be reached on 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bjl

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